

Abstract of the Invention

A unilateral in-plane thermal buckle-beam microelectrical mechanical actuator is formed on a planar substrate of semiconductor material, for example. The actuator includes first and second anchors secured to the substrate and a floating shuttle positioned movable parallel to the substrate. Symmetric first and second sets of elongated thermal half-beams are secured between the floating shuttle and the respective first and second anchors. The first and second anchors and the first and second sets of thermal half-beams are positioned along one side of the floating shuttle. The half-beams are formed of semiconductor material, such as polysilicon. A current source directs electrical current through the thermal half beams via the anchors to impart thermal expansion of the thermal half-beams and hence linear motion of the floating center beam generally parallel to the substrate. A floating cold beam connected between the shuttle and the substrate constrains and amplifies the motion of the shuttle in a predefined direction.